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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,140	08/02/2005	Toru Chikuma	2005_1132A	9976

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EXAMINER

KOSOWSKI, ALEXANDER J

ART UNIT	PAPER NUMBER
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2125

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/544,140

Applicant(s)

CHIKUMA ET AL.

Examiner

Alexander J. Kosowski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 8/2/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1) Claims 28-52, as amended in the pre-amendment filed 8/2/05, are presented for examination. Claims 1-27 have been canceled.

Claim Rejections - 35 USC § 103

2) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3) Claims 28-36, 40-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asai et al (U.S. Pat 5,692,292), further in view of Asai et al (U.S. Pat 6,161,277) (hereafter referred to as "Asai2").

Referring to claim 28, Asai teaches a component mounting apparatus comprising a component feed unit for executing component feed operation for feeding a plurality of components in order to allow the components to be picked up (col. 15 lines 1-21); a head unit which has a plurality of component holding members for releasably holding the components, for executing component holding and pickup operation for holding and picking up the components from the component feed unit to mount the components onto a board by one or the plurality of component holding members (col. 8 lines 49-63); a head unit control section for controlling the component holding and pickup operation of the head unit and a component feed unit control section for controlling the component feed operation of the component feed unit (col. 2 lines 26-44 and col. 3 lines 1-24, whereby each working module has a controller); and a main control section for transmitting recipes of an operation programs for executing the operations in the head

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unit control section and the component feed unit control section to the head unit control section and the component feed unit control section (col. 2 line 24 through col. 3 line 24 and Figure 14, whereby a coordinating control devices controls all of the module controllers and whereby a working schedule is considered a recipe), wherein the head unit control section is operable to execute the component holding and pickup operation on basis of the transmitted recipe and the component feed unit control section is operable to execute the component feed operation based on the transmitted recipe (col. 2 lines 52-67 and col. 15 lines 1-21, whereby each module is controlled based on a transmitted work schedule). However, Asai does not explicitly teach that the head unit control section is operable to transmit a timing signal based on the execution of the component holding and pickup operation to the component feed unit control section, and the component feed unit control section is operable to complete the component feed operation on the basis of the transmitted recipe and timing signal.

Asai2 teaches a component mounting apparatus comprising feeders controlled by a controllable stepper motor which receives signals regarding feeding operation (col. 43 lines 13-65), a computer controls the mounting apparatus based on received signals (col. 55 line 63 through col. 56 line 31 and Figure 24), a mounting head unit is used for holding and picking up components is controlled (col. 45 lines 15-31), and whereby the mounting head and feeder are controlled using generated timing signals which can vary based on processing (col. 61 line 1 through col. 62 line 4 and Figure 25 specifically).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to transmit a timing signal based on the execution of the component holding and pickup operation to the component feed unit control section and to complete the component feed

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operation on the basis of the transmitted recipe and timing signal in the invention taught above since this would provide a circuit-mounting system which reduces the time needed for mounting circuit components on a substrate (Asai2, col. 3 lines 48-55), and since timing signals are utilized to create a relationship among all the operations of a component mounting apparatus (Asai2, col. 61 lines 40-67).

Referring to claim 29, Asai teaches that the head unit control section is provided for the head unit, and the component feed unit control section is provided for the component feed unit (Figure 14).

Referring to claim 30, Asai teaches the above. However, Asai does not explicitly teach that the component feed unit control section is operable to transmit a timing signal based on the executed component feed operation to the head unit control section, and the head unit control section is operable to complete the component holding and pickup operation on basis of the transmitted timing signal and recipe.

Asai2 teaches that a computer controls the mounting apparatus based on received signals (col. 55 line 63 through col. 56 line 31 and Figure 24), and that the mounting head and feeder are controlled using generated timing signals which can vary based on processing (col. 61 line 1 through col. 62 line 4 and Figure 25 specifically).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to transmit a timing signal between components in the invention taught above since this would provide a circuit-mounting system which reduces the time needed for mounting circuit components on a substrate (Asai2, col. 3 lines 48-55), and since timing signals are utilized

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to create a relationship among all the operations of a component mounting apparatus (Asai2, col. 61 lines 40-67).

Referring to claim 31, Asai teaches a head moving unit for executing head moving operation for moving the head unit in a direction roughly parallel to a surface of the board and a moving unit control section for controlling the head moving operation of the head moving unit, wherein the main control section is operable to transmit the recipe for executing the head moving operation in the moving unit control section to the moving unit control section, and the moving unit control section is operable to execute the head moving operation on basis of the transmitted recipe (col. 2 lines 52-67 and col. 30 line 50 through col. 31 line 20 and Figure 20-21, whereby the head moves parallel to the board in response to locations derived from the working schedule).

Referring to claim 32, Asai teaches that the moving unit control section is provided for the head moving unit (Figure 9).

Referring to claims 33-34 and 52, Asai teaches the above. In addition, Asai teaches that the head unit control section operates based on a transmitted recipe (col. 2 lines 52-67). However, Asai does not explicitly teach that the head unit control section is operable to transmit a timing signal based on the execution of the operation to the moving unit control section, and the moving unit control section is operable to complete the head moving operation on basis of a timing signal, that the moving unit control section is operable to transmit a timing signal based on the executed head moving operation to the head unit control section, and the head unit control section is operable to complete the component holding and pickup operation on basis of the transmitted timing signal, nor that the head unit control section is operable to transmit a plurality

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of timing signals formed on basis of elevation positions of each of the component holding members along a direction roughly perpendicular to the surface of the board.

Asai2 teaches a component mounting apparatus comprising feeders controlled by a controllable stepper motor which receives signals regarding feeding operation (col. 43 lines 13-65), a computer controls the mounting apparatus based on received signals (col. 55 line 63 through col. 56 line 31 and Figure 24), a mounting head unit is used for holding and picking up components is controlled (col. 45 lines 15-31), and whereby the mounting head and feeder are controlled using generated timing signals which can very based on processing (col. 61 line 1 through col. 62 line 4 and Figure 25 specifically).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize the limitations above in the invention taught by Asai since this would provide a circuit-mounting system which reduces the time needed for mounting circuit components on a substrate (Asai2, col. 3 lines 48-55), and since timing signals are utilized to create a relationship among all the operations of a component mounting apparatus (Asai2, col. 61 lines 40-67).

Referring to claim 35, Asai teaches that the head unit is operable to execute component mounting operation for mounting the component or components held by the one or the plurality of component holding members by releasing the holding on the board (col. 4 line 37 through col. 5 line 16), the main control section is operable to transmit the recipe for executing the component mounting operation to the head unit control section and is operable to transmit the recipe for executing the head moving operation for the component mounting operation to the moving unit control section and the head unit control section is operable to execute the

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component mounting operation on basis of the transmitted recipe and the moving unit control section is operable to execute the head moving operation for the component mounting operation on basis of the transmitted recipe (col. 2 lines 52-67, whereby the working schedule controls all functions).

Referring to claim 36, Asai teaches the above. In addition, Asai teaches mounting based on a recipe (col. 2 lines 52-67). However, Asai does not explicitly teach that the head unit control section is operable to transmit a timing signal based on the execution of the operation to the moving unit control section, and the moving unit control section is operable to complete the head moving operation for the component mounting operation on basis of the transmitted recipe and timing signal.

Asai2 teaches a component mounting apparatus comprising feeders controlled by a controllable stepper motor which receives signals regarding feeding operation (col. 43 lines 13-65), a computer controls the mounting apparatus based on received signals (col. 55 line 63 through col. 56 line 31 and Figure 24), a mounting head unit is used for holding and picking up components is controlled (col. 45 lines 15-31), and whereby the mounting head and feeder are controlled using generated timing signals which can vary based on processing (col. 61 line 1 through col. 62 line 4 and Figure 25 specifically).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize the limitations above in the invention taught by Asai since this would provide a circuit-mounting system which reduces the time needed for mounting circuit components on a substrate (Asai2, col. 3 lines 48-55), and since timing signals are utilized to

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create a relationship among all the operations of a component mounting apparatus (Asai2, col. 61 lines 40-67).

Referring to claims 40-41, Asai teaches that the main control section comprises a recipe forming section for forming each of the recipes; and a recipe transmission section for transmitting each of the formed recipes (col. 2 lines 52-67), and that the head unit control section, the component feed unit control section or the moving unit control section is operable to transmit error information generated when the operations are executed on the basis of the respective recipes to the main control section, in the main control section, the recipe forming section is operable to correct the recipe relevant to the error information out of the already transmitted recipes on basis of the transmitted error information, and the recipe transmission section is operable to transmit the corrected recipe while in order to allow the already transmitted recipe to be replaced by the corrected recipe (col. 23 line 1 through col. 24 line 52, whereby positional errors are generated and used to modify the working schedule data in the controllers).

Referring to claims 42-43, Asai teaches that the component feed unit comprises a plurality of component pickup positions that are arranged in a line with a constant pitch and arranges the components allowing to be picked up by the component holding members, the component holding members are arranged with a constant pitch of an integral multiple of the constant pitch in the head unit along the direction in which the component pickup positions are arranged (col. 15 lines 1-21), and the recipe for the component feed operation transmitted from the main control section to the component feed unit control section comprises at least positional information of the one or the plurality of component pickup positions where the component feed operation is executed (col. 2 lines 52-67), that the recipe for the component holding and pickup

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operation transmitted from the main control section to the head unit control section comprises at least information capable of recognizing the one or the plurality of component holding members in which the component holding and pickup operation is executed and positional information of the one or the plurality of component pickup positions where the component feed operation is executed (col. 2 lines 52-67).

Referring to claims 44-45, Asai teaches that the recipe for the head moving operation transmitted from the main control section to the moving unit control section comprises at least positional information of a movement position of the one or the plurality of component holding members in a direction roughly along the surface of the board where the component holding and pickup operation is executed or the component mounting operation is executed and that the recipe for the component mounting operation transmitted from the main control section to the head unit control section comprises at least information capable of recognizing the one or the plurality of component holding members by which the component holding and pickup operation is executed or the component mounting operation is executed (col. 2 lines 52-67 and col. 30 line 50 through col. 31 line 20 and Figure 20-21, whereby the head moves parallel to the board in response to locations derived from the working schedule).

Referring to claim 46, the claim varies from claim 28 in that it claims a method rather than an apparatus. The apparatus taught by claim 28 inherently utilizes an identical method for operation. Therefore, referring to claim 46, see rejection of claim 28 above.

Referring to claim 47, Asai teaches that each of the recipe for the component holding and pickup operation and the recipe for the component feed operation is formed on a component mounting apparatus main body side provided with the head unit and the component feed unit,

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and each of the formed recipes is transmitted from the component mounting apparatus main body side to the head unit and the component feed unit (col. 2 lines 52-67, whereby a working schedule is created by a main controller).

Referring to claim 48, see rejection of claim 30 above.

Referring to claim 49, see rejection of claim 31 above.

Referring to claim 50, see rejection of claim 47 above.

Referring to claim 51, see rejection of claim 30 above.

4) Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asai, further in view of Asai2, further in view of Ijuin (U.S. Pat 5,498,942).

Referring to claims 37-38, Asai teaches the above. In addition, Asai teaches controlling a head unit and feeder based on a recipe (col. 2 lines 52-67 and Figure 14). However, neither Asai nor Asai2 explicitly teach an operation program for executing component holding preparation operation for moving down the one or the plurality of component holding members for holding the component or components in the head unit to a component holding standby height position along a direction roughly perpendicular to a surface of the board; and an operation program for executing component holding main operation for further moving down the one or the plurality of component holding members from the component holding standby height position and holding the component or components allowing to be picked up in the component feed unit by the one or the plurality of component holding members, and the head unit control section is operable to make the component feed unit control section recognize completion of the component holding preparation operation on basis of the recipe by transmitting the timing signal, wherein the

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component feed unit comprises a plurality of component pickup positions in which the components are arranged allowing to be picked up by the component holding member, the recipe for executing the component feed operation comprises: an operation program for executing component feed preparation operation for transporting the components in the component feed unit so that the components are positioned in the component pickup positions; and an operation program for executing component feed main operation for putting the transported components into a state in which the components can be picked up by the component holding member, and the component feed unit control section is operable to execute the component feed preparation operation on basis of the recipe, to complete the component feed main operation on basis of the recipe and the timing signal from the head unit control section and to make the head unit control section recognize completion of the component feed main operation by transmitting the timing signal to the head unit control section.

Ijuin teaches a component mounting apparatus which controls component pickup and mounting based on height and uses a unit to feed components to the mounting apparatus and which picks up and mounts on a board on the basis of timing signals (col. 3 through col. 4, col. 8 and Figures 11A-11F).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize the limitations above in the invention taught by Asai and Asai² since this would provide a packaging machine capable of reliably mounting electronic components on printed-circuit boards regardless of different mounting cycles (Ijuin, col. 5 lines 13-17), and since this would allow components to be accurately and stably be mounted on a component support medium (Ijuin, col. 5 lines 55-61).

Referring to claim 39, Asai and Asai2 teach the above. However, they do not explicitly teach that the head unit control section is operable to transmit a plurality of timing signals formed on basis of elevation positions of each of the component holding members along a direction roughly perpendicular to the surface of the board.

Ijuin teaches utilizing timing signals based on head elevation (col. 8 and Figures 11A-11F).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize the limitations above in the invention taught by Asai and Asai2 since this would provide a packaging machine capable of reliably mounting electronic components on printed-circuit boards regardless of different mounting cycles (Ijuin, col. 5 lines 13-17), and since this would allow components to be accurately and stably be mounted on a component support medium (Ijuin, col. 5 lines 55-61).

Conclusion

5) The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Weber et al (U.S. Pat 6,966,738) – teaches an automatic feeding mechanism to interface with pick-and-place machines.

6) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander J Kosowski whose telephone number is 571-272-3744. The examiner can normally be reached on Monday through Friday, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the

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organization where this application or proceeding is assigned is 571-273-8300. In addition, the examiner's RightFAX number is 571-273-3744.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2100.

Alexander J. Kosowski
Primary Examiner
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A handwritten signature in black ink, appearing to read "Alex Kosowski", written in a cursive style.